



# TRIBUTARY TRIBUNE

Stories and Art by Members of the California Conservation Corps  
Watershed Stewards Program, in partnership with AmeriCorps

Year 25, District C



## The Flood

Lindsay Hansen, Placed at NOAA SW Fisheries Science Center

Hidden along the ridgeline of the mountains in this painting is a graph, painted in pink. This graph shows an increase in flooding occurrence worldwide since 1970, and is closely linked to climate change (source: UNISDR). Warming temperatures of the atmosphere and ocean lead to more frequent and more intense storm cells, which dump water onto land masses in unpredictable and intense rainfall patterns.

Unprecedented flood events not only pose a danger to human life and property, but also can have devastating impacts on underwater communities. Extreme flooding can scour streambeds, destroying habitat, and washing fish downstream and into oceans. This can be particularly catastrophic in small coastal streams, where there are no upstream populations of fish to repopulate the waters after the flood.

Story continued on page 2 →

*"The stewardship of our city, our watersheds, and our earth are all deeply connected. Protecting our watersheds isn't an abstract concept, it is something that affects our health, our food, and the places we live."*

- Jackie Van Der Hout

A program of the California Conservation Corps, WSP is one of the most productive programs for future employment in natural resources. WSP is administered by CaliforniaVolunteers and sponsored by the Corporation for National and Community Service and the California Department of Fish and Wildlife.

Watershed Stewards Program—Tributary Tribune



The Flood, continued from page 1

Coho Salmon, such as those illustrated here, require clear, cold water for spawning, egg incubation, and rearing in low gradient streams with gravel at least the size of peas. The newly hatched fish, called fry, move to shallow areas near streambanks where they feed on aquatic insect larvae. These fish are not excellent swimmers, and are dependent upon long-lasting root and log complexity within the creek in order to have adequate habitat for redd building and refuge from swift waters.



Lindsay Hansen proudly displays a male steelhead, which she was able to show as part of our presentation to 30 Cal Poly students. Photo credit: Jessie Kendall-Bar

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If

Karlee Liddy, Placed at NOAA SW Fisheries Science Center

A spoof of “If” by Rudyard Kipling

If you can keep your balance  
When algae-covered rocks mock you,  
If you can trust yourself to spot the redd  
When cow tracks try to fool you,  
If you can tag and not be tired of tagging,  
Or be sweaty and embrace the sweat,  
Or being challenged, don’t give way to impatience  
And yet, do not fall into complacency:

If you can WAP and not make WAP your master,  
If you can cull and not make culling your game,  
If you can meet with teachers and classroom disaster  
And navigate those obstacles without any shame.  
If you can bear to handle spunky spawners  
Twisted by hormones in the trap for fish,  
Or watch as females get stripped of their eggs; goners,  
Yet stand to strip the male of his milt.

If you can make a heap of all your PIT tag needles,  
And tuck them neatly in a bin for the weir,  
And choose to start again the process of cleaning  
And invite Mentors to an assembling party with cheer;  
If you can force your back and arms and legs  
To carry the 75-pound battery long after you should,  
And so hold on while your body begs,  
Then relish in knowing and believing you could.

If you can talk with scientists and keep your nerves,  
Or walk with fish biologists, nor lose the common goal,  
If neither practice nor credence defines who you serve,  
If all Mentors count with you, and help you feel full;  
If you can fill the tiring and humbling days  
With 1700 hours’ worth of creeks explored,  
Yours is the WSP service, and all the opportunities it displays  
And which is more, you’ll find many friends adored.



*Karlee Liddy and Mentor Alex measure the body depth of a female steelhead at the Scott Creek adult trap, while Lindsay Hansen records the data. Photo credit: Jessie Kendall-Bar*

## The Importance of Hands on Science Education

**Carissa Long, Placed at WSP San Luis Obispo**

One of the greatest parts of my service as a Watershed Stewards Program Team Leader was having the opportunity to teach our Wonders of Watersheds (WOW!) curriculum to local 4th grade students at a Title 1 school. I lead many games and hands on activities, including a salmon dissection over the course of six weeks to introduce students to topics related to water, watersheds, and salmonids.

I have spent the last several years working in outdoor education and have found that when teaching science to young students, what they learn is not always as important as how they learn it. The spark and passion for science is not born from years of listening to teachers talk about cells or memorizing facts from a textbook. It is born from a series of meaningful experiences that may or may not be recognized as 'science' at the time.

My own love of science and nature started before I even knew the words for it. I spent childhood summers collecting and planting acorns in my backyard and trying (unsuccessfully) to raise tadpoles in my dad's stone fountain. My passion for marine science began with a squid dissection during a 7th grade fieldtrip. I do not remember any of the facts or vocabulary I learned that day, but the experience stands out in my memory as the first time I felt like a real scientist.

When I teach, I want to instill that same sense of discovery and wonder in my students that I still feel when I explore something new. Students in Title 1 schools may not have ever had the opportunity to explore and discover the world around them the way I did as a child. Maybe years from now, they will fondly remember dissecting a fish in 4th grade, even if they do not remember what a salmonid is.

*"I feel inspired and uplifted to continue on this journey. "*

*- Nina Orellana*

## About the Watershed Stewards Program

**Since 1994, the Watershed Stewards Program (WSP) has been engaged in comprehensive, community-based, watershed restoration and education throughout coastal California.**

**WSP was created in 1994 by California Department of Fish and Wildlife (CDFW) biologists, educators, and the California Conservation Corps to fill critical gaps in scientific data collection, in-stream restoration, and watershed education. In collaboration with landowners, tribal communities, teachers, community members, nonprofit organizations, and government agencies, WSP works to revitalize watersheds that contain endangered and threatened salmonid species (Chinook Salmon, Coho Salmon, and Steelhead Trout) by using state-of-the-art data collection and watershed restoration techniques. WSP also engages members in education, outreach, and volunteer recruitment efforts to increase the capacity of partner organizations. WSP currently has Members working from the Oregon border to the Santa Monica Mountains.**





*Seep City Map of San Francisco's Historical Waterways, Created by Joel Pomerantz. More information at [seepcity.org](http://seepcity.org)*



*Jackie Van Der Hout teaching students at BVHM using the Seep City Map*

# Place and Displacement in San Francisco's Urban Watersheds

**Jackie Van Der Hout placed at San Francisco Bay Regional Water Quality Control Board**

As October approached and with it the beginning of my WSP term, I felt a trepidatious excitement to return to the city I had grown up in. San Francisco has undergone vast social, economic, and ecological changes in the course of my lifetime. I worried that the streets I thought I knew so well would seem unrecognizable to me.

In my six years of absence, San Francisco has maintained its ranking in the top three most expensive cities in North America, at 96.3% above U.S. average ([Kiplinger 2019](#)). Displacement, loss of culture, and loss of home is a heavy heartbreak to wade through. Despite all of this, communities still thrive in the city.

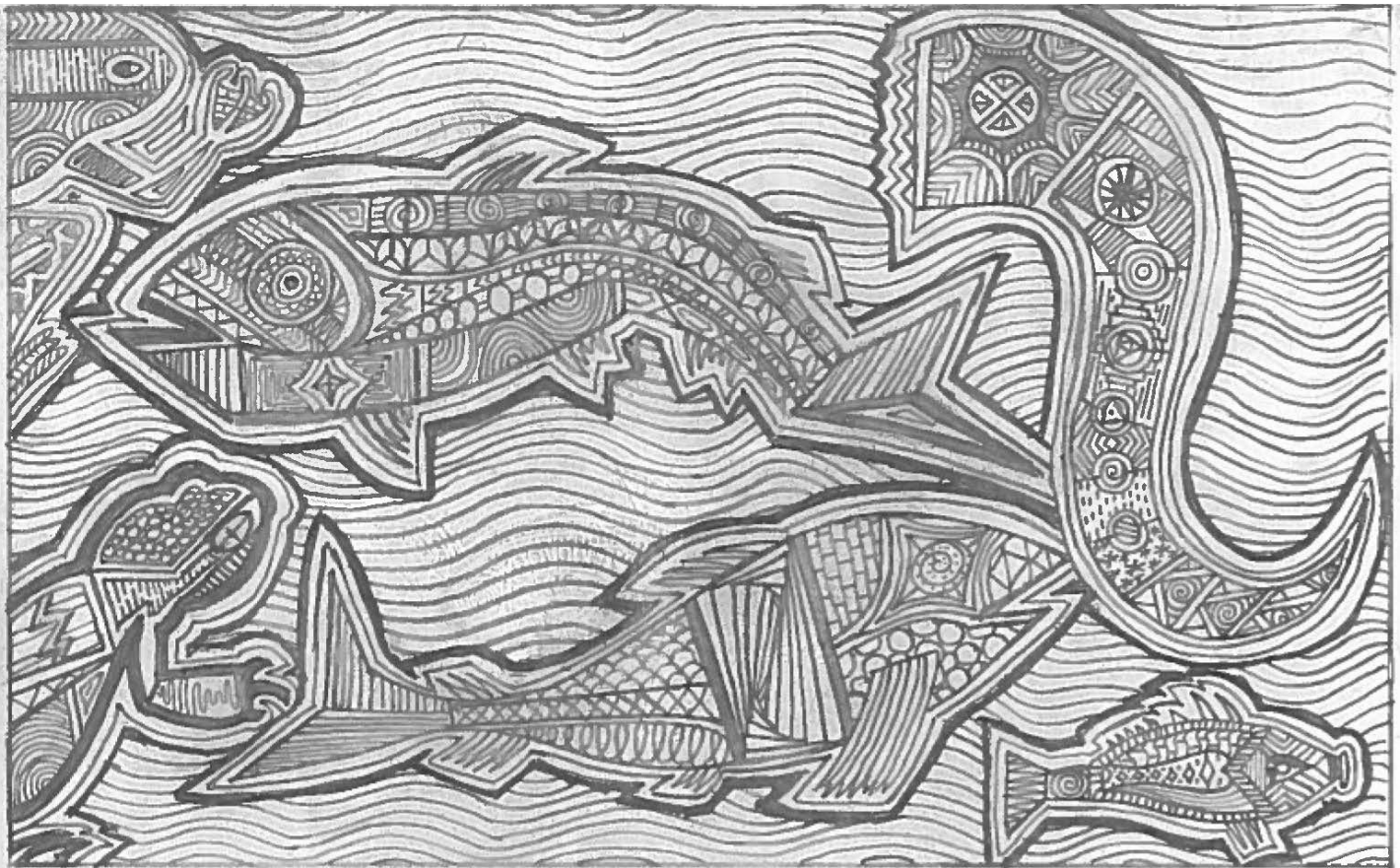
Teaching WSP's WOW! curriculum gave me an opportunity to reconnect with and give back to the communities that raised me. I was able to teach at the same school that I had attended as an elementary student, Buena Vista Horace Mann (BVHM). BVHM is a Spanish-Immersion K-8 in the Mission district and is notable for being home to the first ever overnight shelter inside a public school, a successful pilot program started when more than 25 families at the school were facing homelessness.

I taught three 3rd grade classes at BVHM, two in English and one in Spanish. Returning to teach in both languages at the school that taught me how to read, write, and converse in both felt like a full circle. A highlight was showing the students a map, Seep City (Figure 1), displaying the historical riverways and watersheds of our city which now flow beneath the concrete to make way for human development.

The students I worked with feel a strong sense of home in the city. They know what it's like to fight to protect their home. This feeling of protection and stewardship translates well to environmental issues, but requires nuance and sensitivity. What was the best way to talk about environmental issues to a class where several students may be facing homelessness, eviction, or deportation?

The answer emerged over time. The stewardship of our city, our watersheds, and our earth are all deeply connected. Protecting our watersheds isn't an abstract concept, it is something that affects our health, our food, and the places we live. We all live in a watershed, even here in San Francisco where our rivers have been buried.





## Creek Things

Alex Johanson, placed at Marin Municipal Water District

My Placement Site has allowed me the opportunity to observe many different animals throughout the Lagunitas Creek Watershed. Having grown up the son of an avid fly fisherman and less than three miles from my Placement Site's office, I have always had a fascination with the aquatic organisms with which we share the area. My drawing above honors my favorite aquatic organisms that I have been fortunate enough to see this year. The two fish in the center are coho (*Oncorhynchus kisutch*), the species of salmonids we work hardest to restore. I think they build the most intricate redds, and have the best pigmentation as fry and spawners.

The image in the top-left represents my time coordinating the volunteers in our Frog Docent Program. These volunteers spend their weekends safeguarding one of the three remaining Foothill Yellow-Legged Frog (*Rana boylei*) populations on Mt. Tamalpais, by educating visitors at the falls where they breed. The bottom-left shows my absolute favorite organism that I have loved since I was a child – a newt.

This one is modeled off of a photo I took of a Rough-Skinned Newt (*Taricha granulosa*) early on in my WSP term, and is especially significant because my brilliant site partner taught me everything I know about “herping”. The bottom-right represents a Three-Spined Stickleback (*Gasterosteus aculeatus*), which reminds me of the quarter I spent at the marine biology labs on Friday Harbor my sophomore year of college. We took care of all of the species we learned about in my Biology of Fishes class that term, including the stickleback.

Finally, the top-right shows a lamprey (*Entosphenus tridentatus*), which I caught on my first day as a Watershed Aide at the Marin Municipal Water District in 2017. I didn't know lamprey were in Lagunitas Creek, and I was not prepared to catch one in my net that day. At first, the idea of lamprey living in the creek terrified me, but now I love them so much. I love the way they swim, how difficult it is to hold them, and how they suction onto our buckets before we release them. Serving with WSP and at my Placement Site has allowed me to work with a variety of creatures I love, and I hope my Tributary Tribune reflects how grateful I am to be working at the Marin Municipal Water District.



# Introduction to Fungi

Gabe Elliott and Emma Lewis, Placed at Grassroots Ecology

Fungi are flashy, flavorful, formidable yet fascinating! They are one of the most widely distributed life forms, and perhaps one of the least understood. Fungi are in a separate kingdom of life from plants or animals. Mushrooms are the “fruiting bodies” produced by some fungi to facilitate spore dispersal. Picking mushrooms is more akin to picking apples off a tree than plucking a whole plant.

Ecologically, fungi are essential decomposers and help drive nutrient cycling. Many form mutual symbioses with a wide range of organisms from cyanobacteria to sycamores. Some fungi are edible, some parasitic and some poisonous. This short guide aims to provide a brief overview into the mushrooms of McClellan Nature Preserve, our primary field site.

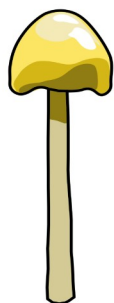


**Name:** Wood Blewit (*Lepista nuda*)

**Description:** This large mushroom grows in leaf duff among deciduous and mixed woodlands. It forms mycorrhizal relationships with many different tree species. The cap, gills and stem show beautiful blue and violet hues when young. As they age, the caps transition to brown, and the gills darken with brown spores. Blewits are a common edible when cooked.

**Name:** Stubble Rosegill (*Volvopluteus gloiocephalus*)

**Description:** Large mushroom with a gray-white cap, crowded white gills, pink spores and a gluey coating on top of the cap when fresh. It is commonly found in pastures and open fields and is non-toxic (but easily confused with the Death Cap - *Amanita phalloides*). It develops out of a membranous “universal veil,” the remnants of which can be found at the base of the mushroom as an identifying feature.

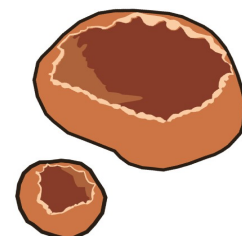


**Name:** Yellow Fieldcap, Egg Yolk fungus (*Bolbitius titubans*)

**Description:** Small, fragile, white stem and pale yellow gills that produce cinnamon spores. This colorful mushroom is most often found in actively grazed pastures and grasslands. They emerge as vivid yellow dots, shoot upwards, fade, and flatten out into gray-black parasols within a day. Their species name -*titubans*- means “staggering” as these short-lived mushrooms perform a slow-motion spore dispersal dance.

**Name:** Palomino Cup (*Peziza repanda*)

**Description:** This fungus forms a wide brown cup-shaped fruiting body: much larger than bird’s nest fungi, with no peridioles. The texture of *Peziza* spp. Is typically somewhat wrinkled and thin with a slightly fuzzy underside. It is found growing on wood chips. This inedible species is widely found in the Americas and Europe.





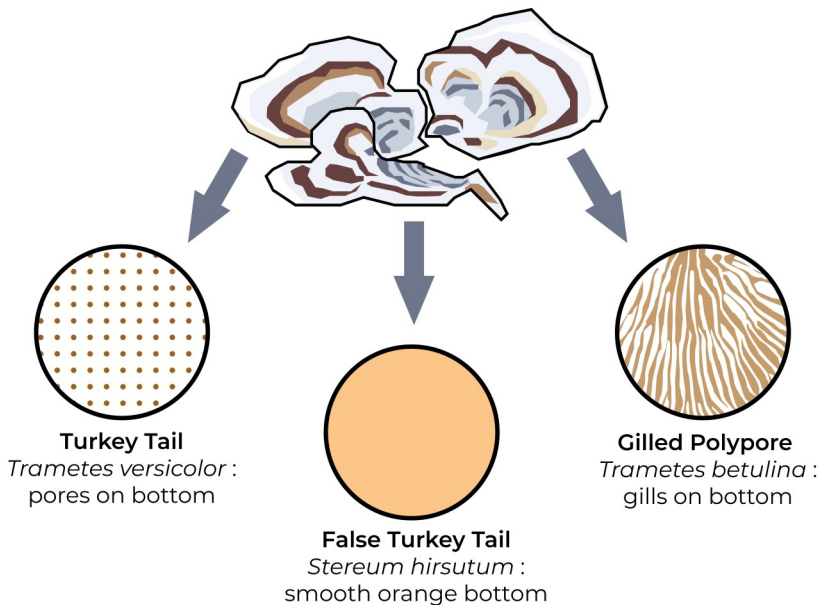


**Name:** Witch's butter (*Tremella aurantia*)

**Description:** This is a small jelly fungus made up of gelatinous clustered yellow-orange folds that resembles a brain. It grows on hardwood and is a popular, relatively tasteless edible. All members of the *Tremella* genus are parasitic on other fungi. By appearance it is virtually indistinguishable from close relative *T. mesenterica*; the two can be differentiated based on their host. *T. aurantia* is parasitic on False Turkey Tail (*Stereum hirsutum*) while *T. mesenterica* prefers generic peniophora crust fungi.

**Name:** Field Bird's Nest (*Cyathus olla*)

**Description:** The fruiting bodies of the Nidulariaceae family are collectively known as bird's nest fungi in reference to their unique spore dispersal strategy. The cup-shaped bodies are full of peridioles: spore-filled structures that resemble eggs. These spore packets depend on the power of falling water to dislodge and disperse themselves. Oftentimes smaller than a centimeter across, these mushrooms grow on decaying wood and are found world-wide.



**Name:** Gilled Polypore (*Trametes betulina*)

**Description:** The third member of the turkey tail trifecta can be distinguished by taking a look underneath the banded, fuzzy cap. *Trametes betulina* has true gills and tends to be more robust in size and shape. The open gills are the key differentiating feature. The colors fade with age and algal growth.

**Turkey Tail Trifecta, differentiated by the underside surface.**

**Name:** True Turkey Tail (*Trametes versicolor*)

**Description:** This leathery crust fungus has distinctive dark, smooth bands on a fan shaped cap similar to the tail pattern on the wild turkey (*Meleagris gallopavo*). One of the most well-known fungi, it is found globally growing on hardwood. *T. versicolor* can be identified by the tiny white pores present on the underside. Turkey Tail is incredibly high in immune-boosting antioxidants and has been recognized as medicinally beneficial for thousands of years.

**Name:** False Turkey Tail (*Stereum hirsutum*)

**Description:** This ubiquitous crust fungus is fittingly called false turkey tail for its many similarities to *Trametes versicolor*, although the underside is very distinctive. It grows gregariously on hardwoods, and can develop layers of algae on old growth. The underside of false turkey tail is smooth and orange, while true turkey tail is creamy white with tiny pores. *Stereum hirsutum* is often more orange-hued and velvety with bristly hairs.





*District C Members at Year 25 Orientation in Fortuna*

## Diversity in STEM

### *Reflections of a Young Scientist*

**Nina Orellana, Placed at Grassroots Ecology**

Starting in the 1960's, it was surmised that diversity in the workforce was beneficial for business' bottom lines; but the world of science took a bit longer to adjust to the emergent socio-economic norms of the time. As late as the 1970's, women were discouraged from taking upper math and science courses in high school, as society believed a woman's only place was at home. This left them at a disadvantage when it came to navigating the world of higher education. Men dominated the disciplines, leaving female peers exhausted from questioning their own abilities, hiding their insecurities, playing catch up, and being downright lonely. Female scientists often felt the need to hide their femininity and suppress their ambitions. There were few professors or advisors who were female, hampering the capacity to inspire young women just like them.

To this day, there exists residue of centuries of patriarchal norms. Luckily things have improved; there are more support systems and female mentors to look up to than ever before. Women are now encouraged to chase after their dreams and pursue whatever intellectual curiosities consume their mind.

**Story continued on page 9**



## The Steelhead Saga

### **Teresa Urrutia, Placed at Point Reyes National Seashore**

Somewhere deep below the sea  
I lived my adult days carefree  
Roaming the Pacific in search of food  
I crossed multiple lines of longitude  
Like the world was made just for me

Yet year after year it's the same routine  
And I've grown tired of this marine scene  
Some instinct calls to me from beyond  
To the stream where I was spawned  
With the goal of passing on my genes

Swimming upstream from the ocean  
I get a sneaking notion  
That by slapping my tail  
I'll ensure my species won't fail  
So I dig a redd, more confident with every motion

There are Chum who'd deny  
That my reproductive success is easy to come by  
But spawning once or even twice  
Is no small sacrifice  
When resources are in short supply

As my fatigue grows with every passing hour  
I release the last of my eggs in a final shower  
Drifting along down the stream  
I can feel myself losing steam  
Living is no longer within my power

Although my time here is done  
I know things will be all right in the long run  
Because for the next generation of Steelhead Trout  
Whose future is bright, I've no doubt  
The journey has only begun.



## Diversity in STEM, continued from page 8.

The problem now seems to be maintaining women in these professions and sustaining the representation of minorities in positions of power. According to a 2014 study done by the [Center for Talent Innovation](#), women who enter careers in science, technology or engineering are 45 percent more likely than men to leave those jobs within a year. Only 23 percent of women with STEM degrees (800,000 women) actually work in STEM fields. Women are paid less than their male counterparts and there is less flexibility when it comes to family leave and childbearing in the research field, where deadlines can be unforgiving. According to a U.S. Commerce Department report, women with STEM degrees are more likely to work in education or health care than in the field of STEM.

Women must not be lumped into a large group as if they act as one, they are not a monolith. Women of color, women with disabilities, and members of the LGBTQ community interact with their surroundings in varying ways and carry their own unique backgrounds along with them. Therefore, to support all women in STEM, the support systems and leadership have to be varied as well. By maximizing the backgrounds that our leaders come from, we will be able to reap the benefits that come along with the diversity of thought.

I say all of this, that women continue to be underrepresented in STEM fields, and that more needs to be done. Yet as I look around and I am constantly reminded that we are the minds and hearts that encourage, support, and inspire the youthful faces and eager bodies wanting to serve not only their community, but Mother Earth as well. And we are mostly women.\* Just look at the Watershed Stewards Program. This is the second Americorps term I've served in a Corps setting, and both groups have been dominated by young women with science degrees. The places I've worked have women leaders, executive directors, and scientists on their staffs. I feel inspired and uplifted to continue on this journey. Certainly, we have come somewhere.

\*This reflects my personal experience and in no way seeks to speak to the experiences of all women in the sciences. \*

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1. Eccles, J. S. (2007). Where Are All the Women? Gender Differences in Participation in Physical Science and Engineering. In S. J. Ceci & W. M. Williams (Eds.), *Why aren't more women in science?: Top researchers debate the evidence* (pp. 199-210). Washington, DC, US: American Psychological Association
2. Noonan, Ryan. Office of the Chief Economist, Economics and Statistics Administration, U.S. Department of Commerce. (November 13, 2017). *Women in STEM: 2017 Update* (ESA Issue Brief #06-17). Retrieved from <https://www.esa.gov/reports/women-stem-2017-update>.
3. Pollack, Eileen. "Why Are There Still So Few Women In Science?" *The New York Times Magazine*, 5 Oct. 2013, [www.nytimes.com/2013/10/06/magazine/why-are-there-still-so-few-women-in-science.html](http://www.nytimes.com/2013/10/06/magazine/why-are-there-still-so-few-women-in-science.html).



*Emma Goodwin instructing at a Bioengineering Workshop in San Pablo*



*WSP Members Emma Lewis, Rebecca Cosmero, and Nina Orellana from Grassroots Ecology with a few volunteers after a rainy creek clean up!*



# Is That an Otter? A Field Guide to the Salmonids of Lagunitas Creek

Keana Richmond, Placed at Marin Municipal Water District

There are five species of salmonids that currently spawn in the Lagunitas Creek Watershed. Between the months of October and March, I spent most of my time walking through Lagunitas Creek looking for these elusive fish and their freshly sculpted redds. I was trained by my Mentors at the Marin Municipal Water District to identify the camouflaged, torpedo-like fish that we observed digging in the gravel or whipping past us in the water. Before starting my term with WSP, I had a modest grasp of California fish identification. Having the opportunity to dive into a watershed with such a wealth of native species has allowed me to exercise my naturalist muscle and build my knowledge base. I wanted to create a field guide of the salmonids found in Lagunitas Creek in part to preserve some of the knowledge that has been imparted to me by the wonderful community of naturalists at my Placement Site. I also wanted to use this guide to share some of the key steps I think are crucial in identifying any

critter, whether they swim or fly or photosynthesize. In my opinion, getting outside and being able to put a name to something and know its natural history is one of the most soul-feeding activities one can practice.

I find that context is one of the most useful tools for identification and two factors in particular can help you to build it. The first factor is habitat. What kinds of things would live where you are? What types of physical features would allow an organism to thrive in that environment? The second factor to consider is seasonality. Knowing when different plants and animals arrive in and leave a specific system can help you to narrow down your list of possible species. Salmonid species have staggered spawning seasons that correspond with their different survival strategies and life histories, making the likelihood of seeing specific species increase and decrease depending on the time of year.

I wrote this guide while trying to keep these factors in mind so that others can know these creatures too. People tend to care about the things they know well, and through my time with these marvelous fish I have gained a deeper respect and affection for them that will not soon leave my heart and mind.



*Pink Salmon*  
Photo Credit: John R. McMillan courtesy of NOAA

## Pink Salmon

**Spawning season:** August – October

**Redds:** Placed above riffles

**Appearance:** Dark backs with bright white bellies; large brown blotches on backs; faces are pointed, with both males and females having a slight up-curve to their snouts; males grow large, camel-like humps while spawning; tails are sharply-pointed at tips.



*Chum Salmon*  
Photo Credit: Fish Eye Guy Photography

## Chum Salmon

**Spawning season:** October - November

**Redds:** Placed at sites of up-welling water, varied positions within creek (i.e. below riffles)

**Appearance:** Females: thick, dark lateral line running from head to tail with greenish/gray backs and bellies. Males: Reddish-pink, flame-like markings running from back to belly which are slightly more difficult to see from above water; triangular heads that come to a point at the nose. Both sexes have very cylindrical bodies.

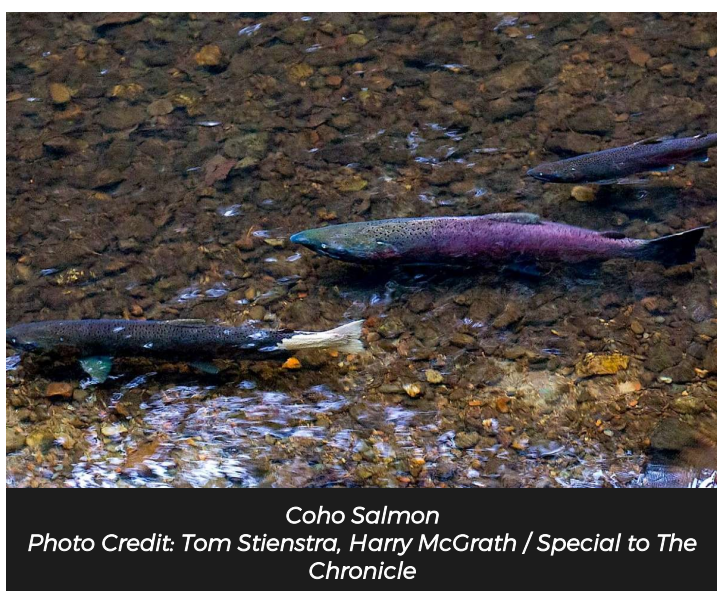


## Chinook Salmon

**Spawning season:** November - January

**Redds:** Found above riffles and sites of down-welling water

**Appearance:** Enormous, coppery or silvery fish with black spots grouped together on back to form short lines and blotches; robust heads and “necks” forward of the dorsal fin; cylindrical bodies; darker blotches can often be seen above pectoral and ventral fins; line of wear running down backs can form after redd-digging and fighting off competitors.

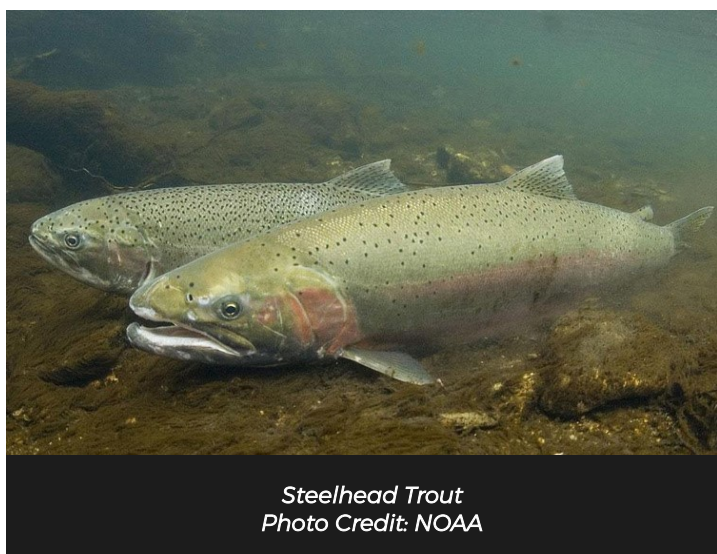


## Coho Salmon

**Spawning season:** December - early February

**Redds:** Above riffles and sites of down-welling water

**Appearance:** Medium-sized fish; males are a deep, dark red with gray/green heads; females may be red or dark grey/brown; tails are very dark, appearing almost black; body color is consistent, with no contrast between backs and bellies; males grow overhanging rostrums called kypes; backs are speckled with small, dark spots that continue down to top edge of tails; females that have been digging redds will have worn tails that appear white from loss of scales and skin; fish look slightly more dorso-laterally-compressed than other species.



## Steelhead Trout

**Spawning season:** January - April

**Redds:** Found above and within riffles and sites of down-welling water

**Appearance:** Large fish; steelhead have blunt heads, much wider and shorter than other Lagunitas salmonids; fish are light green all over with a pink stripe running from gills to tail; back is covered in perfectly-circular spots that may continue midway down fishes' sides; entire tail is also covered in spots; pectoral fins stick out from sides and are often easy to spot through water; fish appear slightly more vertically-compressed than other salmonids.



# The Power of Willows and Cottonwoods in the Urban Environment

Emma Goodwin, Placed at San Francisco Bay Regional Water Quality Control Board

In Oakland and throughout the Bay Area, many streams have been destabilized as a result of development. Destabilization can result from actions such as vegetation removal, channel widening or narrowing, riprap on banks, grade control structures, diversion of flows, and culverted channels.

Our cities now contain heavily impacted channels, that sometimes run underground for much of their extent to make room for the bustle of the city above. Salmonid habitat has decreased exponentially, and in some cases has disappeared completely.

Installation of these hardscape features and the removal of riparian vegetation results in the loss of natural structural components of a stream, along with their natural water quality treatment functions. When a stream is forced to search for stability it incises or widens, ultimately demanding more human intervention where public safety or infrastructure are at risk. Human response to destabilized streams has historically involved installing hardscapes to handle excessive erosion, sedimentation, and deposition. Unfortunately, "riprap and concrete are easily undercut by unstable, adjusting stream channels,"<sup>1</sup> and often become a problem rather than a solution.

Soil bioengineering, or the use of plant material for engineering purposes, uses plant species such as willows and cottonwoods to stabilize banks and provide riparian vegetation benefits to highly impacted streams. These methods are often equally or more effective at stabilizing banks than their concrete counterparts because roots of the powerful riparian plants expand vertically and horizontally, overcoming the cavities caused by erosion and soil loss. Additionally, they restore many of the natural structural and treatment functions of the stream (Figure 1).

At the SF Bay Regional Water Board this year, my site partner and I led soil bioengineering workshops to teach local practitioners, residents, and civilians how to install common bioengineering features such as fascines, brush matting, and posts and stakes. Many attendees were in awe of the simplicity and power of these methods and were made aware of successful bioengineering projects scattered throughout their cities.

Where large willow trees hug the channel in rows, volunteers once stood with a hammer and a stake. The thirsty willows put out their roots extending far and wide to stabilize, cycle, and shade the channel in desperate need of protection.

## Resources:

1. Riley, A. L. (2003). A Primer on Stream and River Protection for the Regulator and Program Manager. San Francisco Bay Regional Water Quality Control Board, Technical Reference Circular, 1-111.

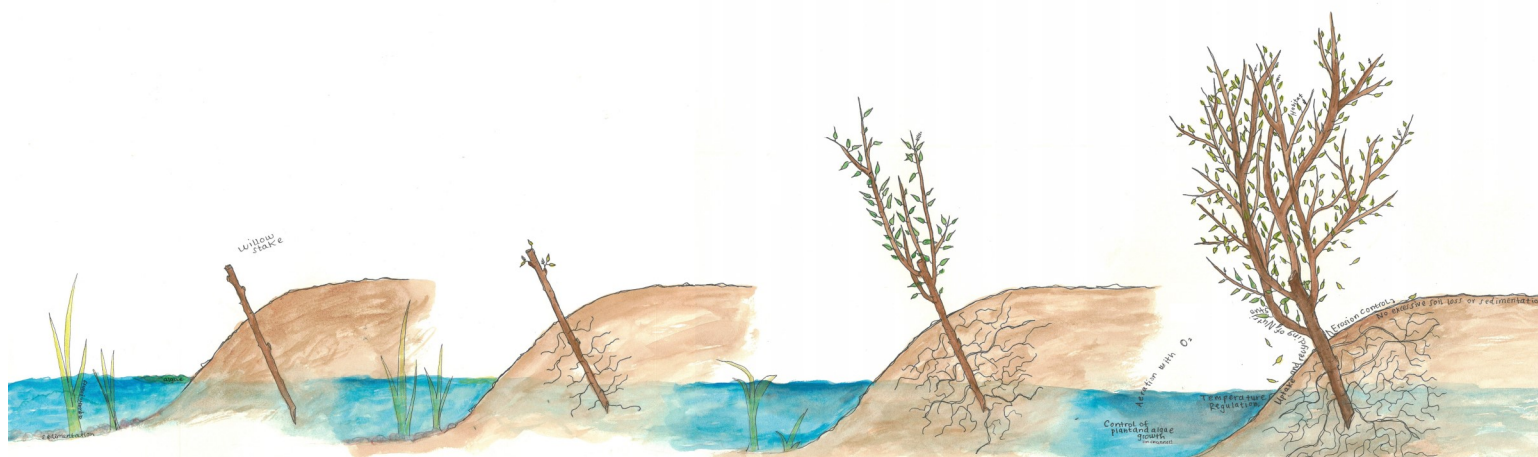


Figure 1: The evolution of willow stake growth showing its natural structural components and treatment functions. Image by Emma Goodwin

# Golden Flowers of the Peninsula

Rebecca Cosmero, Placed at Grassroots Ecology

This WSP term, I have had the opportunity to work (and play) in some of the most beautiful open spaces that the Peninsula and South Bay have to offer. It blows my mind that I get to be up close and personal with nature most days of my work week. With that exposure, I have come to adore wildflower season. Below are some of my favorite native wildflowers to spot!

“When California was wild, it was one sweet bee garden throughout its entire length, north and south, and all the way across from the snowy Sierra to the ocean.” -John Muir



Buttercup (*Ranunculus californicus*)  
Photo Credit: Rebecca Cosmero

## Buttercup (*Ranunculus californicus*)

Often found among the shadows of woodlands and upon grassy hillsides, the buttercup sways in the breeze atop of its delicate branching stem. These subtle blossoms offer pollen to all insects that happen upon it. Native Americans living across the state would often venture into the foothills to collect buttercup seeds as a source of food.



Tidy tips (*Layia platyglossa*)  
Photo Credit: Rebecca Cosmero

## Tidy Tips (*Layia platyglossa*)

The golden petals topped with pale halos are sure to catch your eyes among the grasses. Tidy tips join the spring wildflower display, blooming in meadows and grasslands along the coast range. The tidy tips pictured were spotted among a field of other common wildflowers upon a serpentine grassland at Stanford’s Jasper Ridge Biological Preserve!



CA Poppy (*Eschscholzia californica*)  
Photo Credit: Rebecca Cosmero

## California Poppy (*Eschscholzia californica*)

A broad range of habitats across California host our state’s resilient flower. The orange-red petals blossom at the tip of a slender green stem providing plenty of pollen insects. Before sunset, the petals roll together, tucking any insects into the comfort of nature’s sleeping bag for the night. The Ohlone would prepare a concoction from the flowers to rid the scalp of lice and would place petals beneath the bed of a restless child to help them sleep. The poppy’s thick taproot allows it to persist in areas that are not ideal to all plants making it great for use in restoration projects.



CA Goldfields (*Lasthenia californica*)  
Photo Credit: Will Elder, NPS

## California Goldfields (*Lasthenia californica*)

This brilliantly yellow wildflower can be found carpeting meadows and hillsides along the coast ranges & Sierra foothills. The large flower head attracts bees, moths, and flies for pollination. Native Americans collected seeds from goldfields for seed stews while the petals were used by women in initiation ceremonies. Their fibrous branching roots allow them to persist in areas that are less optimal to other plants. However, the meadows and grassy serpentine hillsides of today’s California boast European grasses that don’t share space, water, or sunlight with our native California wildflowers.



# Alumni Spotlight: Cameron Coronado

WSP Member Year 21,  
Interviewed by Carissa Long

## What was your WSP Member experience like?

Fantastic! WSP allowed me to dive head first into the professional world of salmon recovery. I worked alongside professionals from multiple state, federal, and non-profit agencies, giving me a broad understanding of salmon recovery at all different levels. One aspect of being a WSP Member that I really enjoyed is that I was able to explore so many different disciplines within salmon recovery. From on the ground restoration activities, scientific data collection and monitoring, salmon hatchery operations, and education and outreach.



WSP Alumni Cameron Coronado placed at SJRP during Year 21.

## Was there one experience that was especially memorable? Why?

My site partner and I were involved in a trap and haul program of Chinook Salmon on the San Joaquin River. We would trap adult salmon, tag them, and release them into the study area of the river. Female salmon were tagged with acoustic transmitters which allowed us to monitor their movements throughout the study area. In some cases, the female salmon expelled the transmitter as they deposited their eggs in their redds. This allowed us to determine exactly which female constructed a particular redd! This allowed us to make connections between the size of a female and the size of a redd and the size of substrate used.

## What is your title and responsibilities in your current job? What is involved in a typical day?

Since my term with WSP I have been a Monitoring Coordinator for the Nooksack Salmon Enhancement Association, a Resource Specialist for the Snohomish Conservation District, and am currently a Stormwater Technician for the City of Lynnwood, WA. I am responsible for the education and outreach programs related to environmental issues and surface water pollution and prevention. A typical day involves coordinating environmental educational field trips, outreach and training to business about preventing stormwater pollution on their properties, project management of Low Impact Development projects, and engaging with the public about stormwater issues.

Story continued on page 16



## My Painted Experience

Ayano Hayes, Placed at Point Reyes National Seashore  
Story and illustrations by Ayano Hayes

The paintings illustrated on the next page are snapshots of a few highlights I've experienced so far at Point Reyes National Seashore (PRNS). As a second year WSP Member, I wanted to work at a site that offered an entirely new set of skills and techniques within fisheries. From working in the Klamath River Basin my first year, to now working in the Tomales Bay Lagunitas River Watershed, the influences of the basin, the amount of water, the organization you work for, the protocols you must follow, and the population and species of fish present, have shaped the differences in my experience.

Story continued on page 15





1. On our very first day, we were sent out to Olema Creek to begin surveying for the endangered California Freshwater Shrimp (*Syncaris pacifica*). This was an exciting moment since we were already heading out into the field and collecting baseline data to begin monitoring of this species. Pictured above is a female shrimp we caught that happened to be gravid, carrying eggs!

2. With only a crew of four, we surveyed 7.5 miles of Olema Creek and collectively saw 98 spawning Coho Salmon and documented 50 redds in one day! This event riled up a lot of hope, since starting numbers haven't been this high in 12 years! With a promising spawning season ahead, the government shutdown occurred a couple days later. We were left out of the creek, unable to monitor or collect any data for the bulk of the spawning season but what a day it was!



4. With no prior experience to managing a smolt trap nor witnessing the smoltification stage among salmonids, checking our two pipe traps during our smolt season has been a new and fun experience. Other than handling, tagging, and working up salmonids, we also come across big sculpin, like the one painted to the right. If we don't check the trap in time, a sculpin of such size can easily munch on the buffet of salmonids within the trap. We ended up pulling a dead coho smolt out from within this sculpin and said our prayers.



3. This painting depicts another exciting fish day we had this year on Redwood Creek! Using a long net that is weighted on one side and floating on the other, we seigned a backwater pool and a section of a small tributary to the mainstem. In years past, very little was found in these spots, but to our surprise we caught 68 coho smolts! This event not only gave a positive indication for a good smolt year but also affirmed that restoration efforts for increased salmonid habitat were paying off.





What’s your favorite part of your job now?

My favorite part of my job has been raising and releasing Coho Salmon with grade school students. This year we raised 30,000 coho at our hatchery and environmental education center. We hosted numerous field trips where students learned about water quality, the salmon life cycle, salmon habitat, and what they can do to help keep their watersheds clean and healthy. At the end of the field trip students released their own salmon into the wild, giving them a tangible connection to their local surface waters.

How did WSP help prepare you for the work you are currently doing?

WSP helped me understand how to work effectively with multiple state, federal, and non-profit agencies toward a common goal. I have learned how important partnerships are in salmon recovery. Creating and maintaining productive relationships with colleagues can really help lead to successful projects and programs.

What advice would you give current WSP Members?

Take advantage of the great Mentors you have around you. Some day you may want to be in their shoes with a full-time permanent position doing the work that you love. Sit down with them and have them help you with your resume and cover letter, request letters of recommendation from all your supervisors.

Take advantage of all the trainings, workshops, conferences, etc. This will help to give you a broader understanding of the work that is going on out there and may lead you down a path you never knew about beforehand. Network, network, network! You know the old saying, “It is not what you know, but who you know.” I have found this old saying to be more and more true as I move through my professional career.

Fishy Limericks  
Carissa Long, Placed at WSP San Luis Obispo

While walking along down the creek	They start out as fry, so tiny
The first time I’ve been out all week	As smolt they swim out to the sea
Look there up ahead!	Where they get big and fat
A fish on a redd!	Before they come back
It’s one of the steelhead we seek.	A process known as anadromy.

Become a WSP Member! Learn more about the program and find our application at:  
[ccc.ca.gov/watershed-stewards-program/](http://ccc.ca.gov/watershed-stewards-program/)

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Our Mission

The Watershed Stewards Program’s (WSP) mission is to conserve, restore, and enhance anadromous watersheds for future generations by linking education with high quality scientific practices.

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